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Patent Application  
Docket No. 34647-00407USPT

11/22/99  
10544 U.S. PTO

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Barry O'Driscoll

Entitled: **METHOD FOR MONITORING AUTHENTICATION PERFORMANCE  
IN WIRELESS COMMUNICATION NETWORKS**

10503 U.S. PTO  
09/447179  
11/22/99

To the Assistant Commissioner  
for Patents  
Box Patent Application  
Washington, D.C. 20231

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Signature

Dear Sir:

REQUEST FOR FILING A NATIONAL PATENT APPLICATION

Transmitted herewith for filing, please find the following:

- X   1. Specification, claims and abstract of the above-referenced patent application having   30   pages.
- X   2. Four (4) sheet(s) of drawing(s) (        formal /   x   informal) comprising Figures 1-5B.
- X   3. Combined Declaration and Power of Attorneys (        signed   x   unsigned).
- 3A. No filing fee, Oath, or Declaration is enclosed pursuant to 37 C.F.R 1.53(d).
- 4. Information Disclosure Statement along with Form PTO-1449 and references.

- \_\_\_\_ 5. This is a: \_\_\_\_ Continuation-In-Part; \_\_\_\_ Divisional; \_\_\_\_ Continuation;  
\_\_\_\_ substitute Application (MPEP 201.09) of Application Serial No. \_\_\_\_ filed  
\_\_\_\_; \_\_\_\_ reissue of U.S. Patent No. \_\_\_\_ filed on \_\_\_\_.

An extension to extend the life of the above prior Application to at least the date  
of filing hereof

(One box must be marked)

- (a) \_\_\_\_ is concurrently being filed in that prior Application,  
(b) \_\_\_\_ was previously filed in that prior Application,  
(c) \_\_\_\_ is not necessary for copendency.

- \_\_\_\_ 6. Attached is an assignment to Telefonaktiebolaget L M Ericsson (publ). Please  
return the recorded assignment to the undersigned.

- \_\_\_\_ 7. Priority is claimed under 35 U.S.C. § 119(e) based on filings in the U.S.

	<u>Application No.</u>	<u>Filing Date</u>
(1)	____	____
(2)	____	____
(3)	____	____

\_\_\_\_ (No.) Certified copy (copies) \_\_\_\_ are attached; or \_\_\_\_ were previously filed on  
\_\_\_\_.

- \_\_\_\_ 8. Attached: \_\_\_\_ (No.) verified statement(s) establishing "small entity" status under  
37 CFR § 1.9 and 1.27.

- \_\_X\_\_ 9. Attached:

\_\_X\_\_ Return Postcard  
\_\_\_\_ (Other)

- \_\_\_\_ 10. Preliminary Amendment:

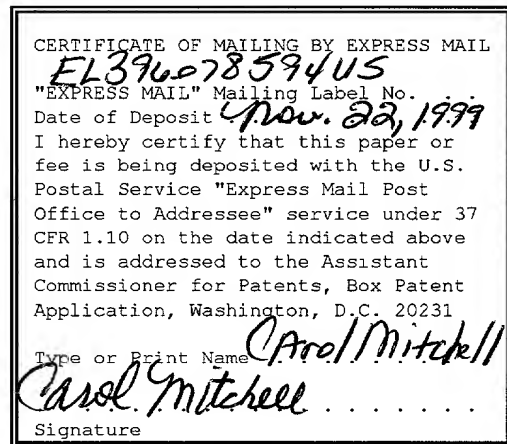
Prior to a first Office Action, kindly amend the Application as follows:

- X 11. The following Filing Fee calculation is based on the claims filed less any claims canceled by the Preliminary Amendment of Item 10.

					SMALL ENTITY RATE		LARGE ENTITY RATE		
BASIC FEE					\$380	OR	\$760	=	\$ 760.00
	NUMBER FILED			NUMBER EXTRA					
TOTAL CLAIMS	<u>24</u>	-20	=	<u>4</u> (at least 0)	x 9	OR	x 18	=	+\$ 72.00
INDEP. CLAIMS	<u>2</u>	-3	=	<u>0</u> (at least 0)	x 39	OR	x 78	=	+\$
If any <u>proper</u> multiple dependent claim (ignore improper) is present (Enter \$0.00 if this is a <u>reissue</u> application.)					+\$130	OR	+\$260	=	+\$
If assignment is x'd (item 6), add recording fee \$40.00									\$
Attached is a Rule 47 Petition (inventor refuses to sign or cannot be reached) \$130									+\$
TOTAL FILING FEE									= \$ 832.00

- X 12. A check in the amount of \$832.00 to cover the Filing Fee calculated in Item 11 is attached. Please charge any deficiency or credit any overpayment to Deposit Account No. 10-0447.
13. Please charge my Deposit Account No. 10-0447 in the amount of \$\_\_\_\_\_ to cover the Filing Fee calculated in Item 11. This sheet is attached in duplicate.
- X 14. The Commissioner is hereby authorized to charge any fee specifically authorized hereafter, or any missing or insufficient fee(s) filed, or asserted to be filed, or which should have been filed herewith or concerning any paper filed hereafter, and may be required under 37 CFR 1.16-1.18 (missing or insufficiencies only) now or hereafter relative to this application and for the resulting Official Document under 37 CFR 1.20, and to have and cause any necessary petition for extension of time to be filed and any fees necessary to be paid for said extension of time OR credit any overpayment to our Deposit Account No. 10-0447, for which purpose a

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METHOD FOR MONITORING AUTHENTICATION PERFORMANCE  
IN WIRELESS COMMUNICATION NETWORKS

BACKGROUND OF THE INVENTION

Technical Field of the Invention

The present invention relates in general to the wireless communications field and, in particular, to an improved method for monitoring authentication performance in wireless communication networks.

Description of Related Art

The Global Challenge (GC) authentication procedure currently used in Time Division Multiple Access/Frequency Division Multiple Access (TDMA/FDMA) mobile communication

systems allows a network operator to validate on the control channel, mobile subscribers' access requests to the network. Each subscriber maintains a unique set of secret authentication keys (i.e., Shared Secret Data or SSD information). This SSD  
5 information is used in certain calculations for the authentication procedure. The subscribers' Home Location Register (HLR) also maintains a copy of the subscribers' secret authentication keys.

The way most operators have implemented their existing  
10 TDMA/FDMA mobile networks, the Mobile Services Switching Center/Visitor Location Register (MSC/VLR) also maintains a copy of the subscribers' secret authentication keys or SSD information. The main purpose for maintaining the subscriber SSD information in an MSC/VLR is to avoid ANSI-41 message  
15 signalling congestion on the transmission link or interface between the MSC and HLR (Reference Point C as defined in the TIA/EIA-41 protocol).

There are a number of different settings needed to ensure that network subscribers are being globally challenged. Examples of these settings are cell indicators and the different access types which are to be globally challenged.

5           A significant problem with the GC authentication procedures used in existing TDMA/FDMA mobile systems is related to the use of these procedures by an external operator (i.e., an operator for a different network's service provider). For example, if a home network's MSC/VLR maintains a copy (which is done in most  
10 networks) of a subscriber's SSD information to be used for authentication purposes, the only ANSI-41 message signalling (apart from an initial access request) conveyed outside the MSC for the GC operation is an Authentication Failure report. This report is generated when a network determines that a fraudulent  
15 access request has been made. Conversely, if a network does not determine that a fraudulent access request has been made, then there is no GC-related report generated by the network that would allow an external operator to determine whether or not

that network's GC function is still active and configured correctly. In other words, for existing TDMA/FDMA mobile networks, an external operator has no proof that another service provider's network (e.g., cooperating in accordance with a valid roaming agreement) has an active GC function. This problem is particularly significant for an external operator of a network having a plurality of roaming agreements with other networks, because the external operator needs assurance that its subscribers are being globally challenged as they roam.

The existing approaches used by network operators to extract authentication information from an MSC are typically proprietary. For example, one application, MDATA, is a proprietary application developed and used by the Ericsson Corporation to extract subscriber authentication information and results from an Ericsson MSC. This approach solves the above-described GC authentication problem to a great extent for Ericsson. However, a significant problem with this and similar proprietary approaches is that an external operator is unable to



access the application directly in order to extract subscriber authentication results from the MSC where the MS is registered. Additionally, the proprietary authentication applications being used typically do not provide access to data across networks  
5 (i.e., no inter-network data transfers are performed). Notably, at present, there are no standardized solutions for reporting a successful GC, neither within one's own network nor to an external network. Nevertheless, as described in detail below, the present invention successfully solves the above-described  
10 problems and other related problems.

SUMMARY OF THE INVENTION

In accordance with a preferred embodiment of the present invention, a method for monitoring network authentication performance in wireless communication systems is provided, whereby a standardized message is used to enable external reporting of a selection of (or all) successful GCs. Any network operator can select which GC results are to be reported to external operators, based on one or more factors such as, for example: subscriber number series (i.e., if a subscriber's number is within a predetermined range, then a successful GC can be reported); predetermined periodicity (i.e., the  $n^{\text{th}}$  successful GC for a subscriber or MSC/VLR can be reported); access type (i.e., a successful GC for a Registration request, Originating Calls, Terminating Calls, and/or Originating Short Messages can be reported), or the successful GCs detected within a specified time duration, SubscriberHLR address, etc.

An important technical advantage of the present invention is that a method is provided for assuring external operators

that the GC function is active and appropriately configured for roaming subscribers' terminals.

Another important technical advantage of the present invention is that a non-proprietary, standardized method is provided for assuring external operators that the GC function is active and appropriately configured for roaming subscribers' terminals.

Still another important technical advantage of the present invention is that a method is provided for enhancing the confidence of network operators working together under national or international roaming agreements.

Yet another important technical advantage of the present invention is that a method for monitoring network authentication performance is provided which is hardware independent.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the method and apparatus  
of the present invention may be had by reference to the  
following detailed description when taken in conjunction with  
5 the accompanying drawings wherein:

FIGURE 1 is a block diagram of an exemplary mobile  
communications network, which can be used to implement a  
preferred embodiment of the present invention;

FIGURES 2, 3 and 4A are related diagrams that illustrate  
10 how a mobile communications network can report GC information  
externally (e.g., to the operator of another network), in  
accordance with a preferred embodiment of the present invention;

FIGURE 4B is a block diagram that illustrates how a mobile  
communications network can report GC information internally, in  
15 accordance with a second embodiment of the present invention;  
and

FIGURES 5A and 5B are related sequence diagrams that  
illustrate a third embodiment of the present invention.

DETAILED DESCRIPTION OF THE DRAWINGS

The preferred embodiment of the present invention and its advantages are best understood by referring to FIGURES 1-5B of the drawings, like numerals being used for like and  
5 corresponding parts of the various drawings.

Essentially, in accordance with a preferred embodiment of the present invention, a method for monitoring network authentication performance in wireless communication systems is provided, whereby a standardized message is used to enable  
10 external reporting of a selection of (or all) successful GCs. Any network operator can select which GC results are to be reported to external operators, based on one or more factors such as, for example: subscriber number series (i.e., if a subscriber's number is within a predetermined range, then a  
15 successful GC can be reported); predetermined periodicity (i.e., the  $n^{\text{th}}$  successful GC for a subscriber or MSC/VLR can be reported); access type (i.e., a successful GC for a Registration request, Originating Calls, Terminating Calls, and/or

Originating Short Messages can be reported), or the successful GCs detected within a specified time duration, SubscriberHLR address, etc.

Specifically, FIGURE 1 is a block diagram of an exemplary mobile communications network 10, which can be used to implement a preferred embodiment of the present invention. Although the exemplary network 10 shown in FIGURE 1 is an ANSI-41 network (i.e., designed in accordance with the ANSI-41 protocol), the invention is not intended to be so limited and can be implemented in any appropriate type of TDMA/FDMA or other mobile communications network (e.g., Advanced Mobile Phone System, i.e., AMPS network, etc.). The basic structure and operation of ANSI-41 networks are known in the communications field. However, for clarity, it is useful herein to briefly describe the entities shown in FIGURE 1.

As such, the exemplary network 10 includes two MSCs (Mobile Switching Centers in ANSI-41 networks) 12 and 14 coupled together by a transmission link 13 (Reference Point E interface

under the ANSI-41 protocol). An MSC functions primarily as an interface for user traffic between the network (10) and other MSCs in the same or other mobile networks, or other public switched networks. An HLR 16 is coupled to the MSC 14 by a transmission link 15 (Reference Point C interface), to a VLR 18 by a transmission link 19 (Reference Point D interface), and to a Message Center (MC) 20 by a transmission link 21 (Reference Point N interface). An MC functions primarily to store and forward short text messages. The VLR 18 is also coupled to the MSC 14 by a transmission link 17 (Reference Point B interface). The MC 20 is coupled to a second MC and a Short Message Entity (SME) 22 by respective transmission links (Reference Point M interfaces). An SME functions primarily to compose and decompose short text messages (i.e., short messages).

FIGURES 2, 3 and 4A are related diagrams that illustrate how a mobile communications network (10) can report GC information externally (e.g., to operator B of network 100), in accordance with a preferred embodiment of the present invention.

Referring to FIGURES 1-4A, for this exemplary embodiment, a mobile station (MS) 106 subscriber of an external network operator B (100) transmits an access request 108 for network A (10). For this embodiment, it can be assumed that network operators A and B have a valid inter-network roaming agreement, and the subscriber's SSD information has been conveyed from the external MSC/VLR 104, or directly from the external HLR, to the network MSC/VLR (14/18) and stored. It can also be assumed that network A (10) has globally challenged the MS 106, and the GC has been successful (e.g., the MS's identity has been authenticated using the stored SSD information). The GC results 24 and 206 (successful, in this case) are conveyed to the HLR 16 and/or a node in the external operator's network (102) and stored.

Focusing on the sequence diagram shown in FIGURE 3 and the block diagram shown in FIGURE 4A, in accordance with the preferred embodiment, a set of ANSI-41 standard messages is created primarily to allow external reporting of successful GC



results. For example, at any appropriate time, network operator B (100) sends a standard message (e.g., GC Report Directive) 202 in an ANSI-41 signalling message format to the MSC 14, which directs the MSC 14 to create a GC Report (successful) for an external B subscriber's access request, and convey the GC Report message (206) to the external operator's network node 102. For this embodiment, the external operator's network node (102) can be an HLR. Also, for this embodiment, the GC Report Directive message 202 for a successful GC can be used for a plurality of external subscribers and preferably includes one or more of the following parameters (using ANSI-41 notation convention for an INVOKE component): INDICATOR (e.g., indicates presence of a GC Report Directive message); GC REPORT ACCESS TYPE; GC REPORT PERIOD START; GC REPORT PERIOD END; GC REPORT FREQUENCY; GC REPORT HLR ADDRESS; GC REPORT MSCID BEGINNING; GC REPORT MSCID END. The MSC 14 acknowledges a successfully received GC Report Directive message by sending a GC Report Directive Response message 204 (preferably in the ANSI-41 format) to the operator

of network B (100). For this embodiment, the GC Report Directive Response message is sent to the network operator as an acknowledgment message and is not required to include any specific GC-related parameter.

- 5 If an access request by an external MS (e.g., 106) produces a successful GC Report message (206) that includes one or more of the above-described GC parameters, a GC Report 206 is sent to an input node (102) in the external network B (100), which can make the report information known to the operator of network B.
- 10 For this embodiment, the input node (102) in the external network B can be an HLR, for example. Also, the GC Report message 206 is conveyed in an appropriate ANSI-41 signalling message format. In this case, the GC Report message 206 includes the following parameters: GC REPORT (identifies
- 15 existence of GC Report); ESN (Electronic Serial Number of the external MS); MSID (external MS's identification); GC REPORT TIME; and GC REPORT SUCCESS ACCESS TYPES. A more detailed description of these new GC parameters is provided below. In

this way, by conveying the above-described messages in an ANSI-41 format, the successful results of a network's GC can be provided to an external operator.

Alternatively, as shown in FIGURE 4A, the operator of network B (100) can send a GC Report Directive message (203) via an alternate route through network A (10) via, for example, the HLR 16 in network A. One reason the Report Directive message might be routed via the network A HLR is that the operator of network A may wish to have total control over the ANSI-41 signalling in and out of the MSC/VLR (14/18). An acknowledgment message (e.g., Report Directive Response) can be sent back to the operator of network B either directly to the node B (102) or via network A.

FIGURE 4B is a block diagram that illustrates a second embodiment of the present invention. Referring to FIGURE 4B, a GC successful order message (e.g., GC Report Directive) 202 can be sent to the primary network's MSC (14) from the operator (A) of that network via network A's HLR (16). An acknowledgment

message (GC Report Directive Response) is sent to acknowledge that the MSC has received the GC successful order message (GC Report Directive). For example, the operator of network A can request one or more successful GC Reports (206) for MSs within  
5 network A. As another example, the operator of network A can request one or more successful GC Reports (206) for operator B's MSs roaming in network A.

FIGURES 5A and 5B are related sequence diagrams that illustrate a third embodiment of the present invention.  
10 Referring to FIGURE 4A, an order for a network (10) to report a successful GC for a specific subscriber can be conveyed to an MSC (14) in an existing ANSI-41 message. For example, the existing ANSI-41 Registration Notification Return Result (RegNot Return Result) message or Qualification Directive (QualDir)  
15 message (208) can be modified to include additional parameters for this purpose, such as, for example, GC Report Access Types, GC Report Period Start and End, and GC Report Frequency. In response to an external network subscriber's access request

(108), a successful GC based on one or more of the parameters included in the order message (e e.g., RegNot Return Result or QualDir) can be reported to network A or B's operators in the above-described GC Report message (206).

5           FIGURE 5B is a sequence diagram that illustrates a different aspect of the third embodiment. Referring to FIGURE 5B, an order for a network (10) to report a successful GC for a specific subscriber can be conveyed to an MSC (14) in another existing ANSI-41 message. For example, the existing ANSI-41  
10   Authentication Directive message (210) can be modified to include additional parameters for this purpose, such as, for example, GC Report Access Types, GC Report Period Start and End, and GC Report Frequency. In response to an external network subscriber's access request (108), a successful GC based on one  
15   or more of the parameters included in the order message can be reported to network A or B's operators in a modified Authentication Status Report message (212).

The following Table includes a description and format for each of the new GC parameters described above, which can be included in a report order message, response to a report order message, and/or a report message, in accordance with the present

5 invention.

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Table 1

GC Report Access Types - Access types for which successful GCs are reported.

HGFEDCBA Octet Value

00000000	1	0	No successful GCs to be reported.
00000001	1	1	Report successful GCs for all access types.
00000010	1	2	Report successful GCs for registrations.
00000100	1	4	Report successful GCs for originating calls.
00001000	1	8	Report successful GCs for terminating calls.
00010000	1	16	Report successful GCs for originating short messages.

GC Report Period Start, GC Report Period End - Report successful GCs that occur during a predetermined period of time (between GC Report Period Start and End).  
GC Report Frequency - Report every  $n^{\text{th}}$  successful GC.

HGFEDCBA Octet Value

1      n

Table 1 (Cont'd)

GC Report HLR Address - Report successful GCs for subscribers registered in a specific HLR.

GC Report MSCID Start, GC Report MSCID End - Report successful GCs for subscribers with subscriber numbers in a predetermined range (between MSCID Start and End).

GC Report

HGFEDCBA Octet Value

00000000 1 0 Not used.

00000001 1 1 GC successful.

GC Report Success Access Types

HGFEDCBA Octet Value

00000000 1 0 Not used.

00000001 1 1 Report is for registration access GC.

00000010 1 2 Report is for originating call GC.

00000011 1 3 Report is for terminating call GC.

00000100 1 4 Report is for originating Short Message Service GC.

GC Report Time - The instant of time that a successful GC occurred.



Although a preferred embodiment of the method and apparatus  
of the present invention has been illustrated in the  
accompanying Drawings and described in the foregoing Detailed  
Description, it will be understood that the invention is not  
5 limited to the embodiment disclosed, but is capable of numerous  
rearrangements, modifications and substitutions without  
departing from the spirit of the invention as set forth and  
defined by the following claims.

WHAT IS CLAIMED IS:

1           1.    A method for monitoring authentication performance in  
2           a wireless communication network, comprising the steps of:  
3           sending an authentication report order message to a mobile  
4           switching center in said wireless communication network, said  
5           authentication report order message including at least one  
6           authentication parameter;  
7           determining whether an access request made to said wireless  
8           communication network is authenticated based on said at least  
9           one authentication parameter; and  
10          if said access request is authenticated based on said at  
11          least one authentication parameter, said mobile switching center  
12          transmitting an authentication report.

13          2.    The method of Claim 1, further comprising the step of  
14          said mobile switching center transmitting an acknowledgment  
15          message responsive to said authentication report order message.

1           3.    The method of Claim 1, wherein said authentication  
2   report order message comprises a Global Challenge Report  
3   Directive message.

4           4.    The method of Claim 3, wherein said Global Challenge  
5   Report Directive message is formatted in accordance with an  
6   ANSI-41 protocol.

7           5.    The method of Claim 1, wherein said authentication  
8   report order message comprises an ANSI-41 Registration  
9   Notification Return Result message.

10          6.    The method of Claim 1, wherein said authentication  
11   report order message comprises an ANSI-41 Qualification  
12   Directive message.

1           7.    The method of Claim 1, wherein said authentication  
2    report order message comprises an ANSI-41 Authentication  
3    Directive message.

4           8.    The method of Claim 2, wherein said acknowledgment  
5    message comprises a Global Challenge Report Directive Response  
6    message.

7           9.    The method of Claim 1, wherein said authentication  
8    report comprises a Global Challenge Report message formatted in  
9    accordance with an ANSI-41 protocol.

10          10.   The method of Claim 1, wherein said authentication  
11   report comprises an ANSI-41 Authentication Status Report  
12   message.

13          11.   The method of Claim 1, wherein said wireless  
14   communication network comprises an ANSI-41 network.

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- 3

1           13. A system for monitoring authentication performance in  
2 a wireless communication network, comprising:

3           a mobile switching center associated with said wireless  
4 communication network;

5           an external network node, said external network node  
6 coupled to said mobile switching center by an inter-network  
7 transmission interface;

8           means for sending an authentication report order message to  
9 said mobile switching center, said authentication report order  
10 message including at least one authentication parameter; and

11          means for determining whether an access request made to  
12 said wireless communication network is authenticated based on  
13 said at least one authentication parameter, said mobile  
14 switching center including means for transmitting an  
15 authentication report if said access request is authenticated  
16 based on said at least one authentication parameter.

1           14. The system of Claim 13, wherein said mobile switching  
2 center further comprises means for transmitting an  
3 acknowledgment message responsive to said authentication report  
4 order message.

5           15. The system of Claim 13, wherein said authentication  
6 report order message comprises a Global Challenge Report  
7 Directive message.

8           16. The system of Claim 13, wherein said authentication  
9 report order message comprises a Global Challenge Report  
10 Directive message formatted in accordance with an ANSI-41  
11 protocol.

12           17. The system of Claim 13, wherein said authentication  
13 report order message comprises an ANSI-41 Registration  
14 Notification Return Result message.

1           18. The system of Claim 13, wherein said authentication  
2           report order message comprises an ANSI-41 Qualification  
3           Directive message.

4           19. The system of Claim 13, wherein said authentication  
5           report order message comprises an ANSI-41 Authentication  
6           Directive message.

7           20. The system of Claim 14, wherein said acknowledgment  
8           message comprises a Global Challenge Report Directive Response  
9           message.

10          21. The system of Claim 13, wherein said authentication  
11          report comprises a Global Challenge Report message formatted in  
12          accordance with an ANSI-41 protocol.



1           22. The system of Claim 13, wherein said authentication  
2       report comprises an ANSI-41 Authentication Status Report  
3       message.

4           23. The system of Claim 13, wherein said wireless  
5       communication network comprises an ANSI-41 network.

6           24. The system of Claim 13, wherein said means for  
7       transmitting comprises means for transmitting said  
8       authentication report to said external network node.

METHOD FOR MONITORING AUTHENTICATION PERFORMANCE  
IN WIRELESS COMMUNICATION NETWORKS

ABSTRACT OF THE DISCLOSURE

A method for monitoring network authentication performance  
5 in wireless communication systems is disclosed, whereby a  
standardized message will be used to enable external reporting  
of a selection of (or all) successful Global Challenges. A  
network operator can select which Global Challenge results are  
to be reported, based on one or more factors such as, for  
10 example: subscriber number series (i.e., if a subscriber's  
number is within a predetermined range, then a successful Global  
Challenge can be reported); predetermined periodicity (i.e., the  
n<sup>th</sup> successful Global Challenge for a subscriber or MSC/VLR can  
be reported); access type (i.e., a successful Global Challenge  
15 for a Registration request, Originating Calls, Terminating  
Calls, and/or Originating Short Messages can be reported), etc.

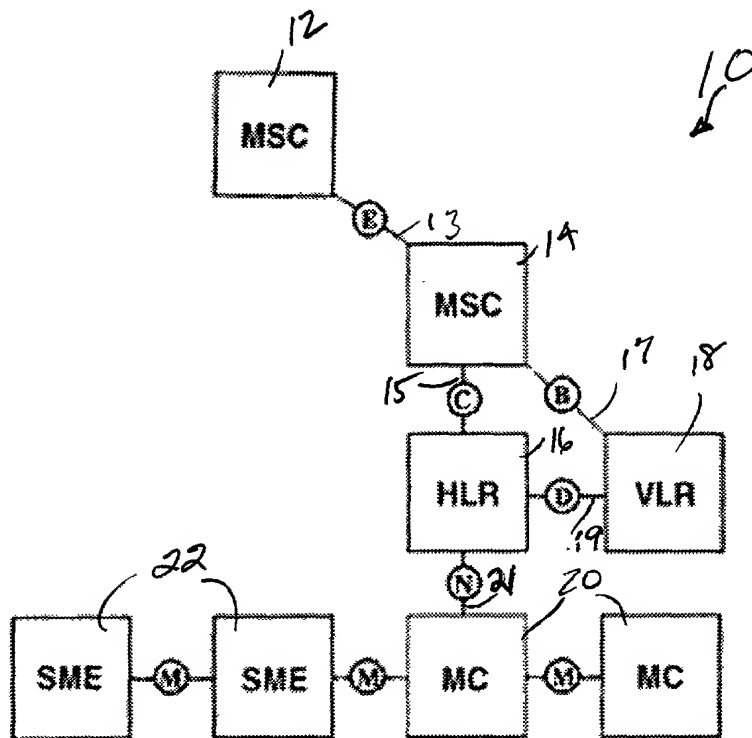


FIG. 1

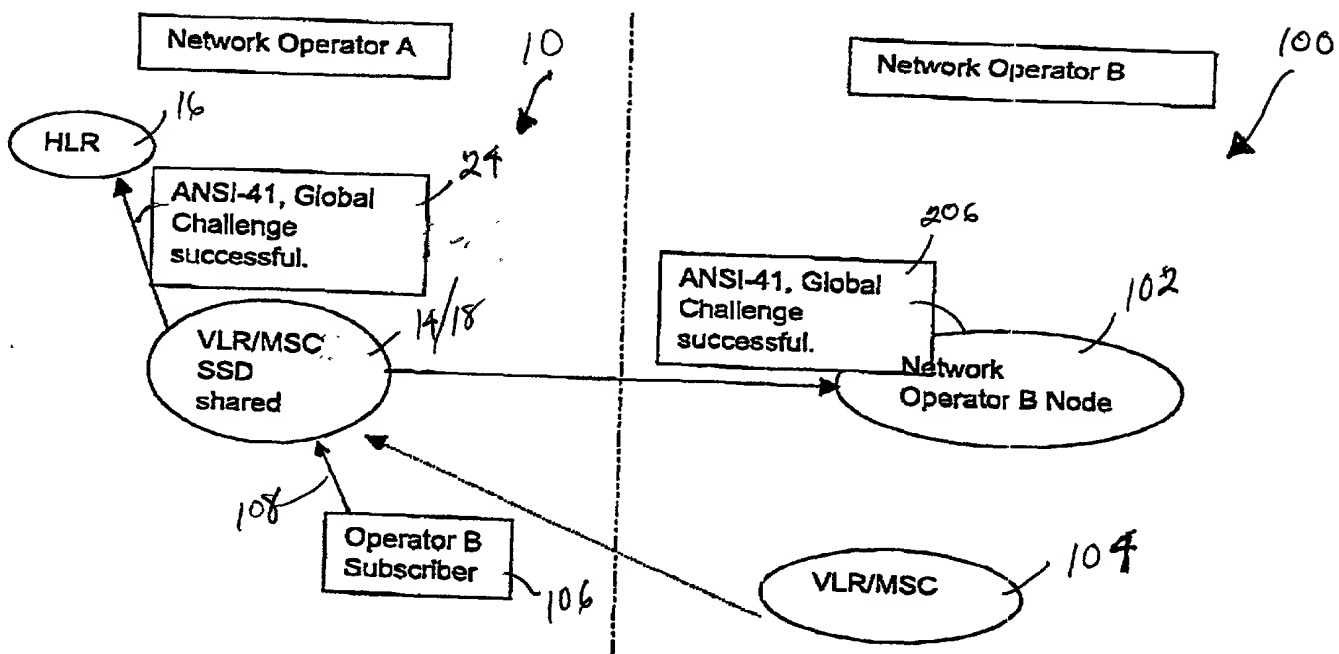


FIG. 2

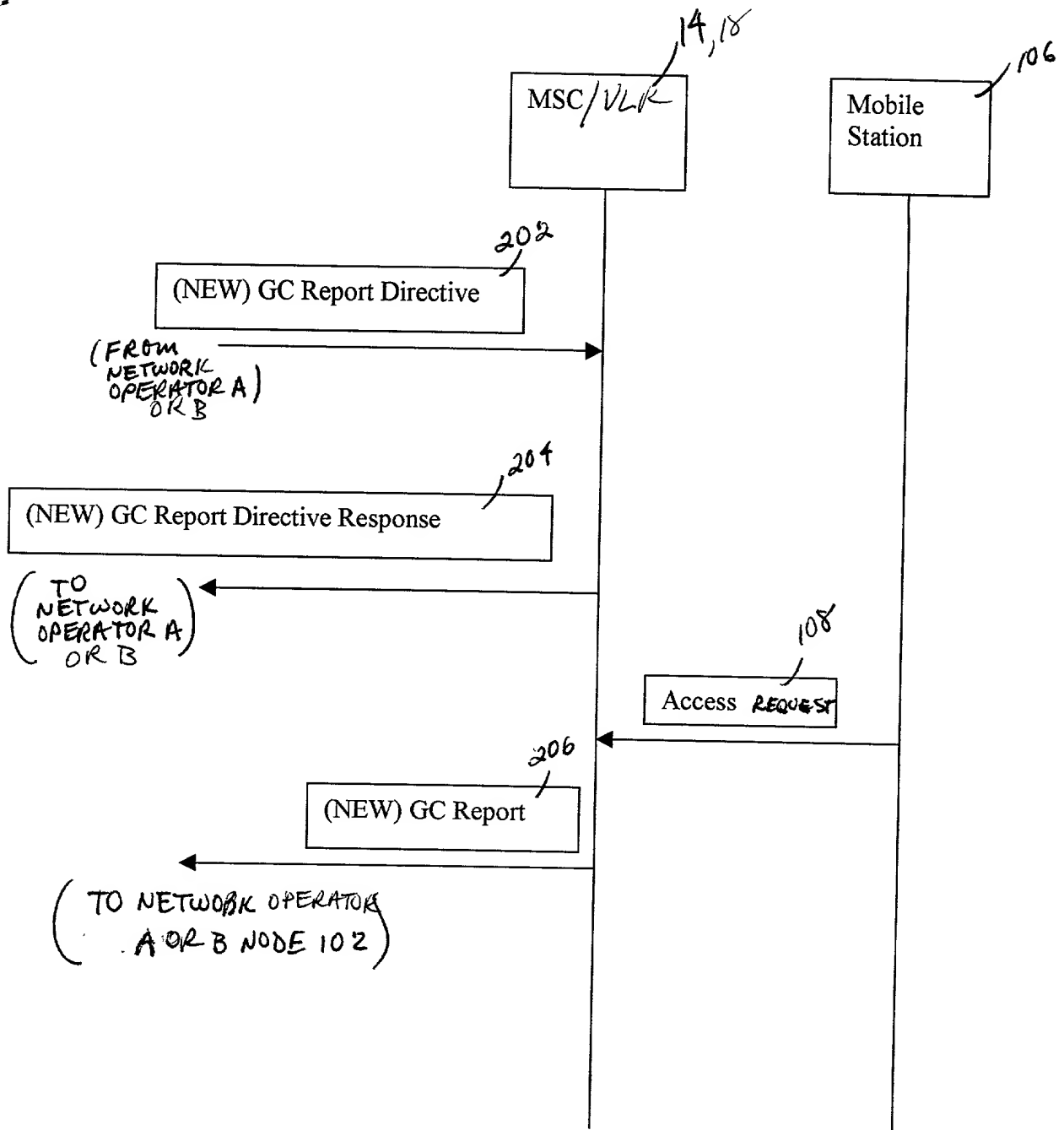
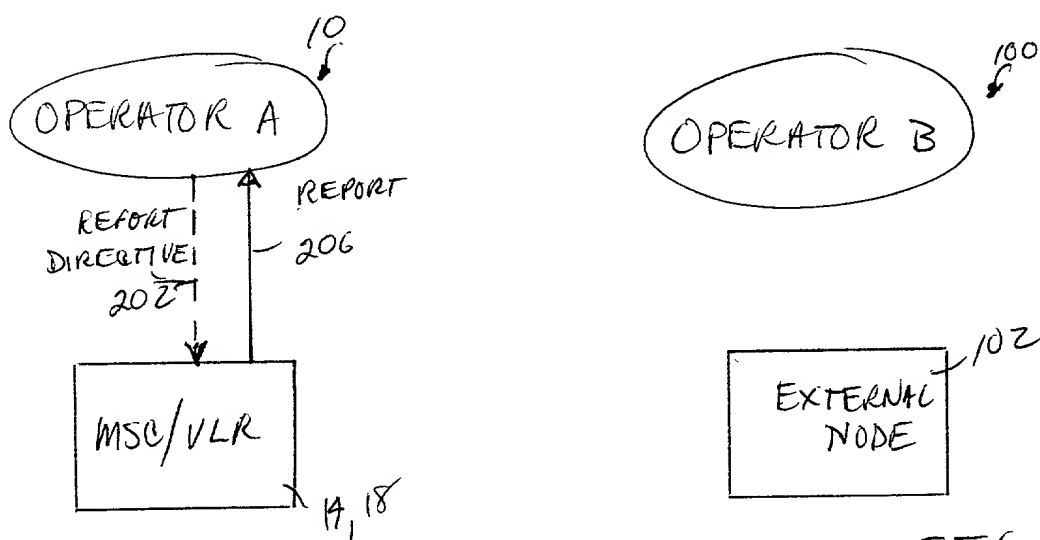
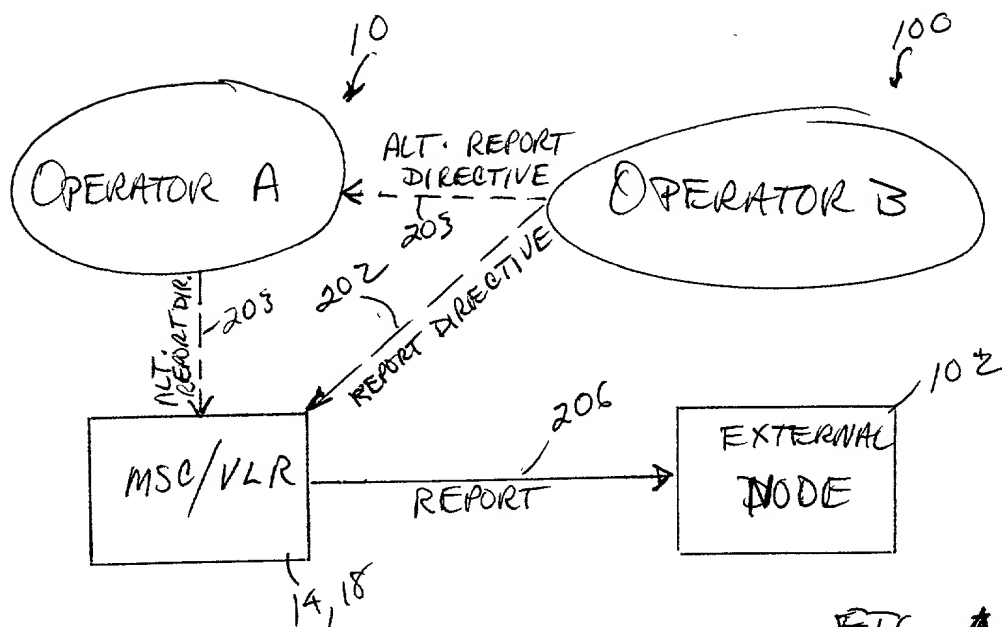
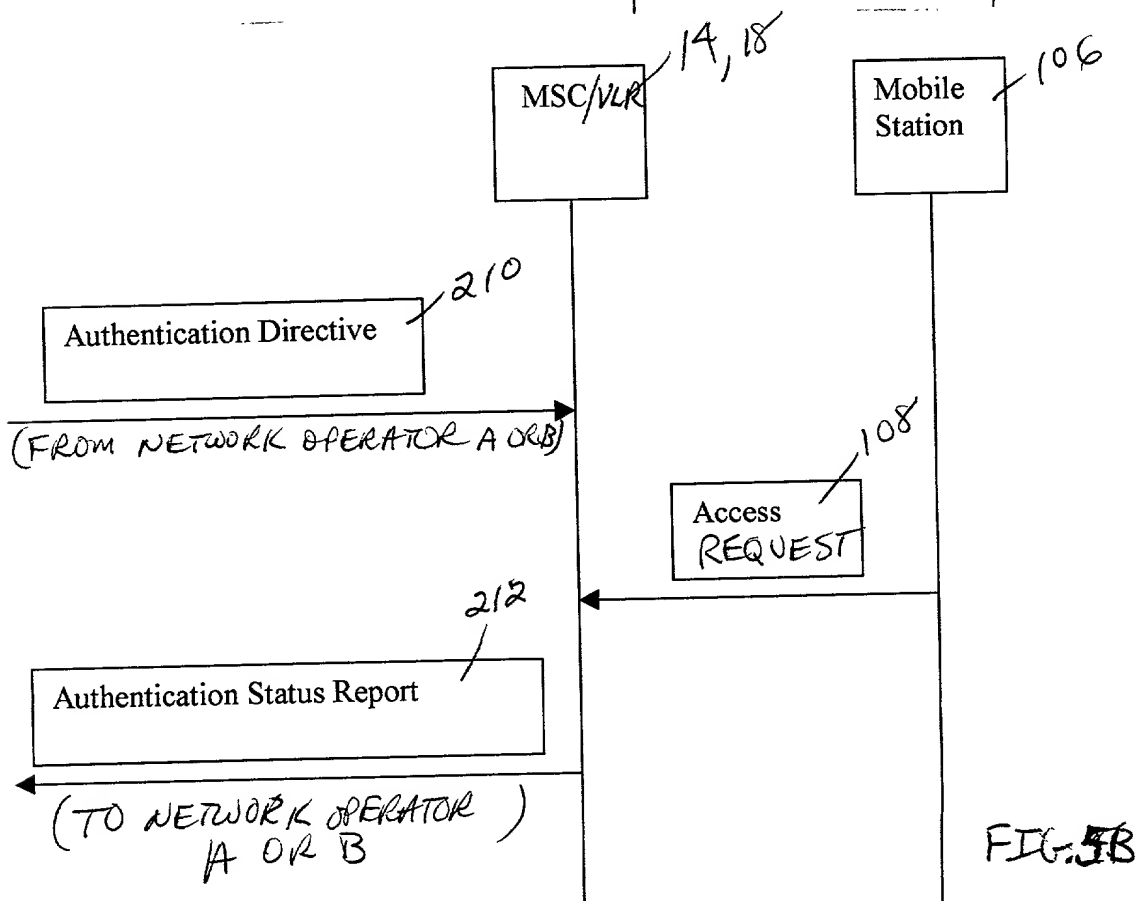
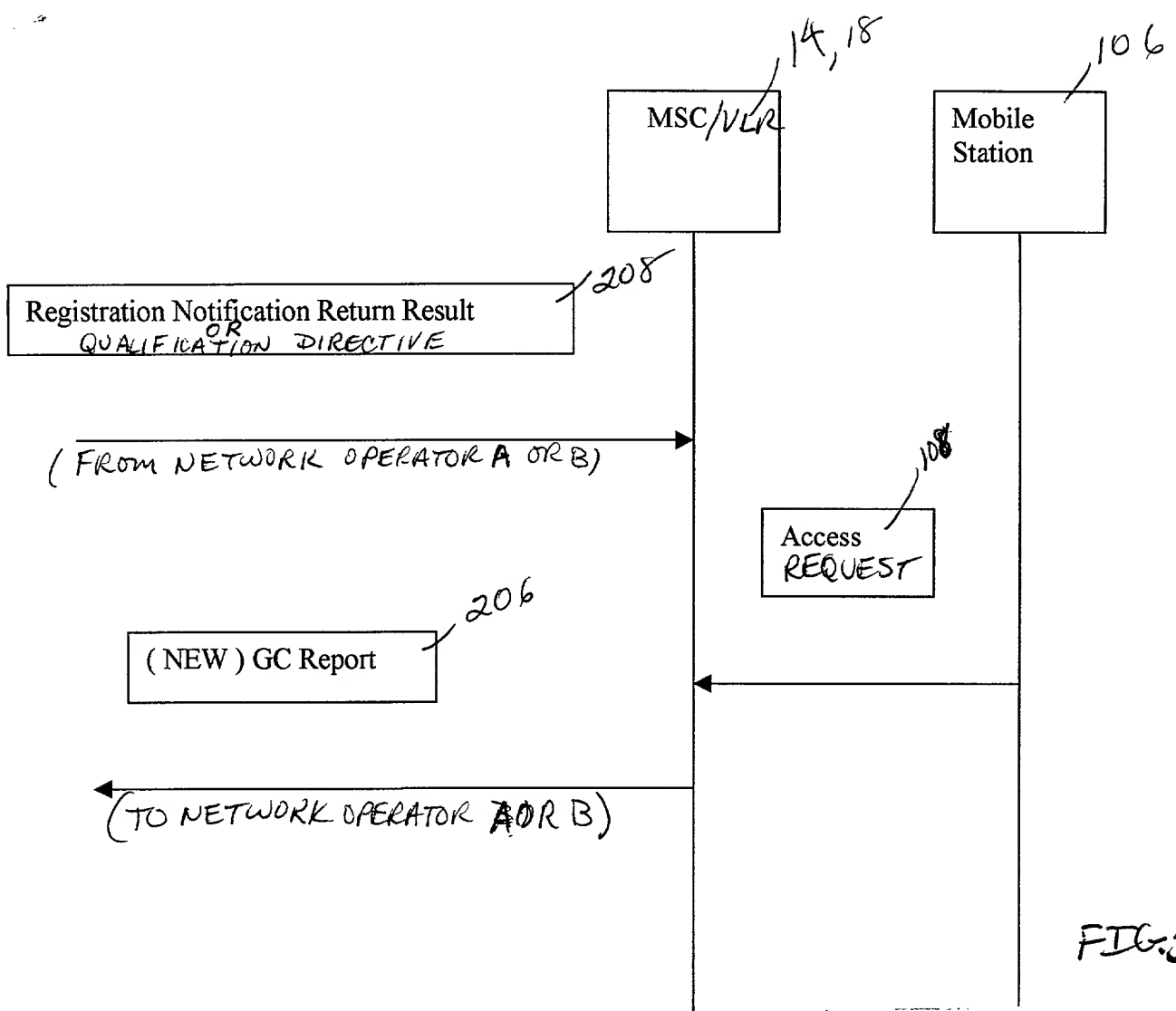


FIG. 3





**RULES 63 AND 67 (37 C.F.R. 1.63 and 1.67)**  
**DECLARATION AND POWER OF ATTORNEY**

**FOR UTILITY/DESIGN/CIP/PCT NATIONAL APPLICATIONS**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name; and

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: METHOD FOR MONITORING AUTHENTICATION PERFORMANCE IN WIRELESS COMMUNICATION NETWORKS, the specification of which: (mark only one)

- X   (a) is attached hereto.  
      (b) was filed on \_\_\_\_\_ as Application Serial No. \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable)  
      (c) was filed as PCT International Application No. PCT/ \_\_\_\_\_ on \_\_\_\_\_ and was amended on \_\_\_\_\_ (if applicable).  
      (d) was filed on \_\_\_\_\_ as Application Serial No. \_\_\_\_\_ and was issued a Notice of Allowance on \_\_\_\_\_.  
      (e) was filed on \_\_\_\_\_ and bearing attorney docket number \_\_\_\_\_.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above or as allowed as indicated above.

I acknowledge the duty to disclose all information known to me to be material to the patentability of this application as defined in 37 CFR § 1.56. If this is a continuation-in-part (CIP) application, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose to the Office all information known to me to be material to patentability of the application as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this CIP application.

I hereby claim foreign priority benefits under 35 U.S.C. § 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate filed by me or my assignee disclosing the

subject matter claimed in this application and having a filing date (1) before that of the application on which my priority is claimed or, (2) if no priority is claimed, before the filing date of this application:

PRIOR FOREIGN PATENTS

<u>Number</u>	<u>Country</u>	<u>Month/Day/Year Filed</u>	<u>Date first laid-open or Published</u>	<u>Date patented or Granted</u>	<u>Priority Claimed</u>	
					<u>Yes</u>	<u>No</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

I hereby claim the benefit under 35 U.S.C. § 120/365 of any United States application(s) listed below and PCT international applications listed above or below:

PRIOR U.S. OR PCT APPLICATIONS

<u>Application No. (series code/serial no.)</u>	<u>Month/Day/Year Filed</u>	<u>Status(pending, abandoned, patented)</u>
_____	_____	_____
_____	_____	_____

I hereby appoint:

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all of the firm of **JENKENS & GILCHRIST, P.C.**, 3200 Fountain Place, 1445 Ross Avenue, Dallas, Texas 75202-2799, as my attorneys and/or agents, with full power of substitution and revocation, to prosecute this application, provisionals thereof, continuations, continuations-in-part, divisionals, appeals, reissues, substitutions, and extensions thereof and to transact all business in the United States Patent and Trademark Office connected therewith, to appoint any individuals under an associate power of attorney and to file and prosecute any international patent application filed thereon before any international authorities, and I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization who/which first sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct them in writing to the contrary.



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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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